



Pulling levers focused deterrence strategies and the prevention of gun homicide

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ABSTRACT

A number of jurisdictions have been experimenting with new problem-oriented policing frameworks to understand and respond to gun violence among gang-involved offenders. These interventions are based on the “pulling levers” deterrence strategy that focuses criminal justice and social service attention on a small number of chronically offending gang members responsible for the bulk of urban gun violence problems. Unfortunately, there is relatively little rigorous evaluation evidence on the effectiveness of these approaches to violence prevention. In Stockton, California, an interagency task force implemented a pulling levers strategy to prevent gun homicide among gang-involved offenders. A U.S. Department of Justice-sponsored impact evaluation suggests that the pulling levers strategy was associated with a statistically significant decrease in the monthly number of gun homicide incidents in Stockton. A comparative analysis of gun homicide trends in Stockton relative to other midsize California cities also supports a unique program effect associated with the pulling levers intervention.

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Introduction

The pulling levers focused deterrence strategy has been embraced by the U.S. Department of Justice (DOJ) as an effective approach to crime prevention. In his address to the American Society of Criminology, former National Institute of Justice Director [Jeremy Travis \(1998\)](#) announced “[the] pulling levers hypothesis has made enormous theoretical and practical contributions to our thinking about deterrence and the role of the criminal justice system in producing safety.” Pioneered in Boston to reduce youth gun violence, the pulling levers framework has been applied in many American cities through federally sponsored violence prevention programs such as the Strategic Alternatives to Community Safety Initiative and Project Safe Neighborhoods ([Dalton, 2002](#)). The pulling levers approach is a specific application of the principles of problem-oriented policing ([Eck & Spelman, 1987](#); [Goldstein, 1990](#)). In its simplest form, the approach consists of selecting a particular crime problem, such as gun homicide; convening an interagency working group of law enforcement practitioners; conducting research to identify key offenders, groups, and behavior patterns; framing a response to offenders and groups of offenders that uses a varied menu of sanctions (“pulling levers”) to stop them from continuing their violent behavior; focusing social services and community resources on targeted offenders and groups to match law enforcement prevention efforts; and directly and repeatedly communicating with offenders to make

them understand why they are receiving this special attention ([Kennedy, 1997, 2006](#)).

Despite the enthusiasm for the approach, there was little rigorous scientific evidence that pulling levers deterrence strategies have been useful in preventing serious violence beyond the Boston experience ([Wellford, Pepper, & Petrie, 2005](#)). Several early evaluations of pulling levers interventions consisted of simple pre/post-comparisons without comparison groups. Even in Boston, the exact contribution of pulling levers to the reduction of youth violence was unclear ([Wellford et al., 2005](#), p. 10). Two recent rigorous evaluations of pulling levers interventions implemented in Indianapolis and Chicago, however, have revealed significant homicide prevention gains associated with the approach ([McGarrell, Chermak, Wilson, & Corsaro, 2006](#); [Papachristos, Meares, & Fagan, 2007](#)). Given the growing popularity of the approach, more evaluation research on its violence prevention effectiveness is clearly needed.

This article describes the results of a DOJ-funded evaluation of a pulling levers focused deterrence strategy in Stockton, California implemented in the late 1990s. Problem analysis research revealed that criminally active gang members, who had ongoing disputes with rival gangs, were central to Stockton's gun homicide problem. The pulling levers strategy broadly fit the nature of the violence and was appropriately tailored to the characteristics and dynamics of local gangs and the operational capacities of law enforcement organizations, social service agencies, and community-based groups in Stockton. The evaluation suggests that the pulling levers strategy, called Operation Peacekeeper, was associated with a significant reduction in gun homicide in Stockton. The observed reduction was distinct when compared to gun homicide trends in other midsize

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California cities. This article begins by discussing the appropriateness of problem-oriented policing strategies in addressing gang violence problems, reviews the existing evidence on the violence prevention effects of pulling levers, describes Stockton's experience with the approach, presents the analytic framework and results of the impact evaluation, and concludes with a discussion of the key elements of the approach that could be transferred to other cities.

Problem-oriented policing and preventing gang violence

Pulling levers strategies have been framed as problem-oriented policing exercises designed to prevent serious violence among gang-involved offenders (Braga, 2002). Conflicts among street gangs have long been noted to fuel much of the violence in U.S. cities. City-level studies had found gang-related motives in more than one-third of homicides in Chicago (Block & Block, 1993), 50 percent of the homicides in Los Angeles' Hollenbeck area (Tita, Riley, & Greenwood, 2003), and 60 percent of youth homicide in Boston (Kennedy, Piehl, & Braga, 1996).¹ Firearms are usually the weapons of choice in urban gang violence problems (Klein, 1995). Dealing with gangs and gang-related violence is a challenge for most police departments in the U.S. In 2003, 96 percent of law enforcement agencies serving jurisdictions with populations 250,000 and above and 91 percent of those serving a population between 100,000 and 249,999 reported gang problems (Egley, 2005).

Problem-oriented policing has been suggested as a promising way to prevent gang violence (Decker, 2003; Huff, 2002). Problem-oriented policing works to identify *why* things are going wrong and to frame responses using a wide variety of often-untraditional approaches (Goldstein, 1979). Using a basic iterative approach of problem identification, analysis, response, assessment, and adjustment of the response, problem-oriented policing has been effective against a wide variety of crime, fear, and order concerns (see e.g., Weisburd & Eck, 2004). This adaptable and dynamic analytic approach provides an appropriate framework to uncover the complex mechanisms at play in gang violence and to develop tailor-made interventions to reduce gang-related victimization. While there are important parallels in gang activity across cities, such as the small number of urban youth who actually participate in gangs (Esbensen & Huizinga, 1993) and the expressive nature of much gang violence (Decker, 1996), the character of criminal and disorderly youth gangs and groups varies widely both within and across cities (Curry, Ball, & Fox, 1994). The problem-oriented approach facilitates understanding of local gangs and associated gang violence so responses can be logically linked to the nature of the problem. As Scott Decker (2003, p. 288) suggests, one of the crucial factors in responding to gangs is how the problem is understood.

Evidence on the violence prevention value of pulling levers strategies

Nationally, without the support of a formal evaluation, Boston's Operation Ceasefire pulling levers strategy was hailed as an unprecedented success (see e.g., Butterfield, 1996; Witkin, 1997). These claims followed a surprising large decrease in youth homicide after the strategy was fully implemented in mid-May 1996. More rigorous examinations of youth homicide in Boston soon followed. A DOJ-sponsored evaluation of Operation Ceasefire used a quasi-experimental design to analyze trends in serious violence between 1991 and 1998. The evaluation reported that the intervention was associated with a 63 percent decrease in monthly number of Boston youth homicides, a 32 percent decrease in monthly number of shots-fired calls, a 25 percent decrease in monthly number of gun assaults, and, in one high-risk police district given special attention in the evaluation, a 44 percent decrease in monthly number of youth gun assault incidents (Braga, Kennedy, Waring, & Piehl, 2001). The timing of the "optimal break" in the time series was in the summer months after Ceasefire was

implemented (Piehl, Cooper, Braga, & Kennedy, 2003). The evaluation also suggested that Boston's significant youth homicide reduction associated with Operation Ceasefire was distinct when compared to youth homicide trends in most major U.S. and New England cities (Braga et al., 2001, p. 215).

Other researchers, however, have observed that some of the decrease in homicide may have occurred without the Ceasefire intervention in place as violence was decreasing in most major U.S. cities. Fagan's (2002) cursory review of gun homicide in Boston and in other Massachusetts cities suggests a general downward trend in gun violence that existed before Operation Ceasefire was implemented. Levitt (2004) analyzed homicide trends over the course of the 1990s and concluded that the impact of innovative policing strategies, such as Operation Ceasefire in Boston and broken windows policing and Compstat in New York, on homicide was limited. Other factors, such as increases in the number of police, the rising prison population, the waning crack-cocaine epidemic, and the legalization of abortion, can account for nearly the entire national decline in homicide, violent crime, and property crime in the 1990s. Using growth-curve analysis to examine predicted homicide trend data for the ninety-five largest U.S. cities during the 1990s, Rosenfeld, Fornango, and Baumer (2005) found some evidence of a sharper youth homicide drop in Boston than elsewhere, but suggested that the small number of youth homicide incidents precludes strong conclusions about program effectiveness based on their statistical models.² In his examination of youth homicide trends in Boston, Ludwig (2005) suggested that Ceasefire was associated with a large drop in youth homicide, but given the complexities of analyzing city-level homicide trend data, there remained some uncertainty about the extent of Ceasefire's effect on youth homicide in Boston.

The National Academies' Panel on Improving Information and Data on Firearms (Wellford et al., 2005, pp. 238–239) concluded that the Ceasefire evaluation was compelling in associating the intervention with the subsequent decline in youth homicide. The Panel also suggested, however, that many complex factors affect youth homicide trends and it was difficult to specify the exact relationship between the Ceasefire intervention and subsequent changes in youth offending behaviors. While the DOJ-sponsored evaluation controlled for existing violence trends and certain rival causal factors such as changes in the youth population, drug markets, and employment in Boston, there could be complex interaction effects among these factors not measured by the evaluation that could account for some meaningful portion of the decrease. The evaluation was not a randomized, controlled experiment. The nonrandomized control group research design cannot rule out these internal threats to the conclusion that Ceasefire was the key factor in the youth homicide decline.

The National Academies' Panel also found that the evidence on the effectiveness of the pulling levers focused deterrence strategy in other settings was quite limited (Wellford et al., 2005, p. 240). The available evidence on the effects of pulling-levers programs in other jurisdictions was scientifically weak. Sudden large decreases in homicide and serious gun violence followed the implementation of pulling levers in Baltimore, Maryland (Braga, Kennedy, & Tita, 2002); Minneapolis, Minnesota (Kennedy & Braga, 1998); Stockton, California (Wakeling, 2003); and High Point, North Carolina (Coleman, Holton, Olson, Robinson, & Stewart, 1999). Unfortunately, these assessments did not use control groups and relied upon simple pre/post-measurements of trends in homicide and nonfatal serious gun violence. In East Los Angeles, a DOJ-sponsored replication of Operation Ceasefire experienced noteworthy difficulty keeping the social service and community-based partners involved in the interagency collaboration (Tita, Riley, Ridgeway, Grammich, Abrahamse, & Greenwood, 2003). The law enforcement components of the intervention were fully implemented and focused on two gangs engaged in ongoing violent conflict. The quasi-experimental evaluation revealed that the focused enforcement resulted in significant short-term reductions in violent crime and gang crime in targeted areas relative to matched comparison areas.

Since the publication of the Panel's report, two rigorous evaluations of the effects of pulling levers on gang violence in other jurisdictions have been completed. A quasi-experimental evaluation of the Indianapolis Violence Reduction Partnership found that the pulling levers strategy was associated with a 34 percent reduction in homicide in Indianapolis (McGarrell et al., 2006, p. 223). When compared to homicide trends in the nearby cities of Cleveland, Cincinnati, Kansas City, Louisville, and Pittsburgh, the evaluation found that Indianapolis was the only city experiencing a statistically significant decrease in homicide during the study time period. In Chicago, a quasi-experimental evaluation of a Project Safe Neighborhoods gun violence reduction strategy found significant reductions in homicides in treatment neighborhoods relative to control neighborhoods (Papachristos et al., 2007, p. 224). The evaluation found that the largest effect was associated with preventive tactics based on the pulling levers strategy, such as offender notification meetings that stress individual deterrence, normative change in offender behavior, and increasing views on legitimacy and procedural justice.

The strategic prevention of gun homicide in Stockton, California

Stockton is a midsized city located about sixty miles east of the San Francisco Bay area and has a geographic expanse of nearly fifty-three square miles. According to the 2000 U.S. Census, Stockton was the thirteenth largest city in California with 243,771 residents that were 43 percent White, 20 percent Asian, 11 percent Black, and 24 percent mixed or other races. Nearly one-third of Stockton residents considered themselves of Hispanic or Latino origin. The median annual household income of Stockton residents was \$35,453 and the median home value was \$119,500. This was well below the California median annual household income of \$47,493 and median home value of \$211,500. Like most urban centers, a notable proportion of Stockton residents lived in poverty. Twenty-four percent of Stockton residents lived below the poverty level as defined by the U.S. Census Bureau (2000). Among the eighty-one law enforcement agencies in California

jurisdictions with population sizes of 100,000 residents or greater that reported to the Uniform Crime Reports program in 2000, Stockton ranked fifth with a violent crime rate of 1219.2 per 100,000 residents and seventh with a homicide rate of 12.3 per 100,000 residents (Federal Bureau of Investigation, 2001).

Implementing pulling levers: Stockton's Operation Peacekeeper

Stockton's experience with the pulling levers focused deterrence strategy, known as Operation Peacekeeper, has been extensively documented in a report jointly published by the California Attorney General's Office and the California Health and Human Services Agency (Wakeling, 2003, p. 1). This section summarizes the trajectory of the Stockton intervention; interested readers should consult the more detailed report. The program description below draws from the material presented in Wakeling (2003, pp. 1–8).

The city of Stockton averaged thirty-five gun homicides per year between 1990 and 1997 (Fig. 1). In 1997, Stockton residents felt that the city was on the cusp of a new wave of gang-related gun violence when several young women—all bystanders—were killed in gang violence over the span of just a few months (Wakeling, 2003, p. 1). The Stockton Police Department (SPD) and other local, state, and federal criminal justice agencies believed that most of the gun violence problem was driven by gang conflicts and the pulling levers approach used in Boston might be effective in reducing gang-related gun violence. In September 1997, the SPD began by reassigning several patrol officers to a new unit that would focus exclusively on violent gangs. The Gang Street Enforcement Team (GSET) targeted any illegal behavior by an active violent gang including driving without a license or registration, drinking in public, and selling drugs. The goal was to get and keep the attention of violent gangs while sending a clear message: "We're here because you've been violent, and we will be here until the violence stops" (Wakeling, 2003, p. 3). GSET officers were free from regular patrol duties and could stay with a gang for as long as was necessary to curb violence.

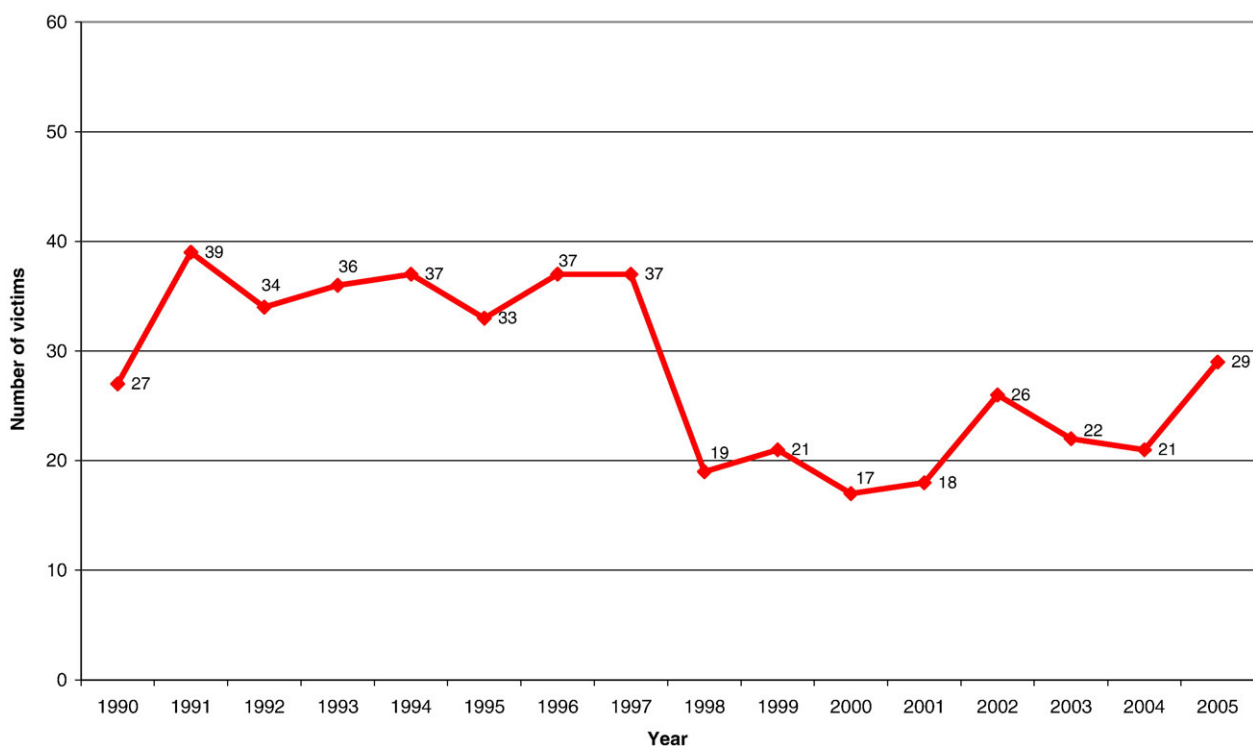


Fig. 1. Gun Homicides in Stockton, California, 1990 – 2005.

Over the next several months, the SPD formed an interagency working group to link the efforts of all the local, county, state, and federal law enforcement agencies already at work on the problem of gang violence in San Joaquin County. Key participants in the effort, which the participants dubbed Operation Peacekeeper, were the San Joaquin County District Attorney's Office, the San Joaquin County Probation Department, the San Joaquin County Sheriff's Office, the California Youth Authority parole office, the California Department of Corrections parole office, the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), the Federal Bureau of Investigation (FBI), and the U.S. Attorney's Office (Wakeling, 2003, p. 3). The Peacekeeper working group also partnered with officials from San Joaquin County to focus social service and opportunity provision programs to provide targeted gang-involved youth with meaningful alternatives to violence.³ Gang outreach workers worked in close partnership with community probation officers, school officials, and other members of decentralized integrated service teams to offer a wide range of public and private services. Key services included employment services, wrap-around services for youth and their families, and services designed to improve school performance. They also worked with the local Private Industry Council to provide jobs to gang-involved youth.

The SPD and participating law enforcement agencies also engaged community partners, most notably members of the clergy in neighborhoods suffering from gun violence problems. By including faith-based partners in the Peacekeeper strategy, the working group developed a mechanism for transparency and accountability that was very desirable to Stockton's minority community (Wakeling, 2003, p. 5). Frequent and regular meetings to share information and sharpen interagency strategies were a prominent feature of the initiative. In essence, Stockton created a very powerful "network of capacity" to prevent gun homicide (Moore, 2002). This network was well positioned to launch an effective response to serious gun violence because criminal justice agencies, community groups, and social service agencies coordinated and combined their efforts in ways that could magnify their separate effects. Operation Peacekeeper capitalized on these existing relationships by focusing the network on halting ongoing cycles of gun violence among Stockton gangs.

The Operation Peacekeeper pulling levers focused deterrence strategy involved deterring violent behavior by chronic gang offenders by reaching out directly to gangs, saying explicitly that gun violence would no longer be tolerated, and backing that message by "pulling every lever" legally available when violence occurred (Kennedy, 1997, p. 461). Stockton gangs were not subjected to increased law enforcement attention arbitrarily nor did the working group develop a "hit list" of gangs. Enforcement actions by the working group were triggered by outbreaks of gun violence. As was the case in Boston, Stockton gangs selected themselves for focused law enforcement attention by engaging in gun violence. When gun violence occurred, working group members and their social service and community-based partners sent a direct message to violent gang members that they were "under the microscope" because of their violent behavior. GSET and other SPD officers immediately flooded the targeted gang's turf and communicated to gang members that their presence was due to the gun violence. Probation and parole officers walked the streets of neighborhoods occupied by target gangs and actively checked that their highest-risk probationers and parolees were abiding by the conditions of their supervised release (Wakeling, 2003, p. 5). Arrested gang members received priority prosecutions by the San Joaquin County District Attorney and gangs that persisted in violent behavior received the enhanced attention of the U.S. Attorney's Office. Gang outreach workers and clergy walked the streets and explained that they wanted the violence to stop and supported the efforts of their law enforcement counterparts to cease the violence. Gang outreach workers also made offers of services and opportunities to gang members.

Federal prosecutions of violent gang members comprised a key enforcement lever in Operation Peacekeeper. In August of 2000, the

largest Peacekeeper enforcement effort was completed when twenty-three members of one of the city's most violent gangs, South Side Stockton, were removed from the street on federal gun and drug charges. Assistant U.S. Attorney Richard Bender commented, "We took the core out of what had been the South Side Stockton gang" (Tempest, 2001, p. A1). In early 2002, another Peacekeeper-related investigation by the Federal Bureau of Investigation (FBI) Violent Crime Task Force resulted in the prosecution of six leaders of the violent Westside Blood, Conway Crips, and East Coast Crips gangs on federal drug trafficking charges.⁴ Over the course of the Peacekeeper initiative, Assistant U.S. Attorney Bender reported that the U.S. Attorney's Office separately prosecuted another twenty-five street gang members on federal felon-in-possession gun charges after these individuals were arrested by GSET as part of Peacekeeper enforcement actions.⁵ While specific case numbers were not available, Bender also reported that, prior to the Peacekeeper initiative, it was very rare for the U.S. Attorney's Office to adopt felon-in-possession cases for federal prosecution.

While enforcement actions were carried out, the Peacekeeper collaborative continued the communications with violent gang members started by GSET (Wakeling, 2003, p. 3). A direct and explicit message was delivered to violent gangs that shootings would no longer be tolerated and that the interagency group would use whatever means were legally available to stop gun violence. This message was also communicated to other gangs not engaged in gun violence so they would understand what was happening to the targeted gang and why it was happening. In addition to talking directly to gang members on the street, the partners used a wide variety of methods to get this message out. The most common method was a group meeting with gang members, which the partners referred to as a "forum" (Wakeling, 2003, p. 4). Most forums involved targeted individuals on probation or parole that were at high risk of becoming involved in gang violence (as either victims or perpetrators). Forums were held at local secure facilities for youth (particularly those about to be released) and at schools and recreation centers. In these meetings, representatives from each agency provided a brief message to gang members: "If any member of your gang commits an act of violence, you won't just hear from the police department, you will hear from all of us. We will be working together, and we will focus on your entire gang until the violence stops" (Wakeling, 2003, p. 4). The message was always balanced with a genuine offer for services provided by gang outreach workers, social service agencies, and the faith community. A review of administrative records maintained by former San Joaquin County Juvenile Justice Coordinator Stewart Wakeling documented that forty-four Peacekeeper forums, with a total attendance of some 810 gangsters, were held between September 1997 and December 2002.⁶

The role of problem analysis

Like many problem-oriented policing efforts, Operation Peacekeeper did not follow the linear and separate steps of the SARA (scanning, analysis, response, assessment) model (Braga & Weisburd, 2006; Capowich & Roehl, 1994). The analysis phase challenges police officers to analyze the causes of problems behind a string of crime incidents or substantive community concern (Goldstein, 1990, p. 80). Once the underlying conditions that give rise to crime problems are known, police officers develop and implement appropriate responses. From the outset, the SPD used crime analysis to document the basic dimensions of homicide in Stockton. These analyses suggested that most homicides were committed with firearms, many incidents involved gang members that were caught in ongoing cycles of retribution with their rivals, and the offenders and victims were very well known to the criminal justice system (Wakeling, 2003, p. 5). At first blush, the pulling levers strategy seemed to be an appropriate approach to dealing with a serious gun violence problem that was

highly concentrated among gang-involved chronic offenders engaged in ongoing disputes. The SPD immediately formed GSET and proceeded to work with partners to fully implement Operation Peacekeeper. As Peacekeeper operations unfolded, the SPD engaged a more systematic assessment of their homicide problem to stay focused on the appropriate high-risk groups, understand evolving street violence dynamics, and develop innovative tactics (Wakeling, 2003, p. 5). Key findings of this analysis are described here.

The problem analysis closely examined all Stockton homicide incidents between 1997 and 1999 (N=104 victims, N=77 offenders). Seventy-four percent of the homicides were committed with firearms (N=77). The criminal histories of Stockton homicide offenders and victims were characterized by a wide range of offenses—or “cafeteria-style” offending, as Malcolm Klein (1995) terms it in his research on gang offending patterns (p. 22). The research found that some 71 percent of homicide offenders and 68 percent of homicide victims had been arrested at least once by the SPD before they committed their crime or were victimized. Individuals that were previously known to the criminal justice system were involved in a wide variety of offenses, and on average, committed many prior crimes. Stockton homicide victims and offenders were arrested for prior armed violent crimes, unarmed violent crimes, property crimes, drug crimes, nonviolent gun crimes (such as illegal gun possession), and disorder offenses. On average, previously known homicide offenders had been arrested for six prior offenses and previously known homicide victims had been arrested for seven prior offenses. The problem analysis research also confirmed that many homicide victims and offenders had a history of criminal justice supervision in the community. Forty-one percent of homicide victims had been under probation supervision before they were killed and 24 percent were on probation or parole at the time they were killed. Fifty-four percent of homicide offenders had been under probation supervision before they killed and 40 percent were on probation or parole at the time they killed.

A working group of SPD detectives and gang unit officers was convened to review the circumstances of the homicide incidents.⁷ Using the crime incident review method (see Braga, 2005; Klofas & Hipple, 2006), the SPD found that 41 percent of the homicide incidents and 60 percent of gun homicide incidents had circumstances that involved gang-related motives. Beyond the circumstances of the homicide, 53 percent of the victims and 61 percent of the offenders were identified as gang members.⁸ At a later date, the same group identified forty-four active street gangs in Stockton with an estimated membership of approximately 2,100 individuals representing about 2 percent of Stockton residents between the ages of twelve and thirty-four. A small number of gang-involved individuals generated a disproportionate amount of gun homicide in Stockton.

The problem analysis research also revealed that most gang conflicts were personal and vendetta-like. While some gang disputes involved drug business and money issues, the bulk of gang violence involved a cycle of retaliation between groups with a history of antagonisms (Wakeling, 2003, p. 5). Stockton gangs had ongoing feuds that fell largely within particular racial groups: Asian gang conflicts, Hispanic gang conflicts, and African American gang conflicts. Within each broad set of ethnic antagonisms, particular gangs formed alliances with other gangs. For example, the Asian Boys and associates were united in their fight against the Asian Gangsters, Crazy Brother Clan, Tiny Rascal Gang, Moon Light Strangers, and associates. Conflicts among Hispanic gangs mainly involved a very violent rivalry between Norteno gangs (associated with criminal groups and gangs in northern California) and Sureno gangs (associated with criminal groups and gangs in southern California). While Norteno and Sureno gangs were united in their fight against their common rivals, however, they also had ongoing conflicts within their loose alliances. For instance, the SPD officers reported that the Norteno gangs South Side Stocktone and East Side Stocktone had a relatively long-standing feud but have helped each other in their conflicts with the Sureno gangs. African

American gangs, such as the Westside Bloods and East Coast Crips, divided along Blood (red gang colors) and Crip (blue gang colors) lines.

Informal assessment of effectiveness

Similar to the Boston experience with Operation Ceasefire, advocates claimed that Operation Peacekeeper “worked” in preventing serious gun violence without the benefit of a rigorous impact evaluation. A 2001 *Los Angeles Times* story, for instance, reported that gang-related homicide in Stockton had dropped by 80 percent (Tempest, 2001, p. A1). The California Attorney General's Office and the California Health and Human Services Agency endorsed the Peacekeeper approach as a model gun violence prevention program (Wakeling, 2003, p. 1). Simple within-city trend analyses supported these positions (Fig. 1). The Operation Peacekeeper intervention was in place from September 1997⁹ until December 2002.¹⁰ Between 1990 and 1997, Stockton averaged thirty-five gun homicides per year. While Peacekeeper was functioning, gun homicides decreased by nearly 43 percent to an average of twenty gun homicides per year between 1998 and 2000. Gun homicides remained relatively low after Peacekeeper ceased with an average of twenty-four gun homicides per year between 2003 and 2005. As described earlier, the National Academies' Panel reviewed the existing research evidence on Peacekeeper and other replications of the Boston approach, and commented that these studies were mostly descriptive in nature and recommended more rigorous evaluations of the pulling levers approach (Wellford et al., 2005, p. 241). This article presents a more rigorous assessment of the gun homicide prevention effects associated with Stockton's Operation Peacekeeper program.

Impact evaluation

Like most evaluations of crime prevention programs (Ekblom & Pease, 1995), the evaluation design departs from the desirable randomized controlled experimental approach. Operation Peacekeeper was aimed at all areas of Stockton with a serious gun homicide problem. There were no control areas (or control gangs) set aside within the city because of the following: (1) the aim was to do something about gun homicide wherever it presented itself in the city, (2) the target of the intervention was defined as the self-sustaining cycle of violence in which all gangs were caught up and to which all gangs contributed, and (3) the communications strategy was explicitly intended to affect the behavior of gangs and individuals not directly subjected to enforcement attention. Given these limitations, it was not possible to compare areas and groups affected by the strategy to similar areas and groups not affected. The analysis of impacts within Stockton associated with the Peacekeeper intervention followed a basic one-group time series design; a nonrandomized quasi-experiment was used to compare gun homicide trends in Stockton to gun homicide trends in other midsize California cities (Campbell & Stanley, 1966; T. Cook & Campbell, 1979; Rossi & Freeman, 1993).

The key outcome variable in the assessment of the impact of the Peacekeeper intervention was the citywide monthly number of gun homicides in Stockton between January 1, 1990 and December 31, 2005. The gun homicide data for the 1990 through 2004 time period were acquired from FBI Supplementary Homicide Report (SHR) data archived at the National Archive of Criminal Justice Data at the University of Michigan's Inter-university Consortium of Political and Social Research. The SPD Crime Analysis Unit provided 2005 gun homicide incident data.¹¹ It is well known that police incident data, such as the SHR, have shortcomings. Crime incident data are biased by the absence of crimes not reported by citizens to the police and by police decisions not to record all crimes reported by citizens (see Black, 1970). Since the presence of a corpse is necessary for the crime to occur, homicide data do not suffer from the same reporting limitations as other police incident data. Careful analyses of SHR data

can yield reliable and valid insights on objective characteristics of homicide incidents such as victim sex, victim age, and weapons used (Maxfield, 1989; Riedel, 1989). SHR data are also widely used for assessing trends and patterns in violent offending (Blumstein, 1995; P. J. Cook & Laub, 2002) and the evaluation of violence reduction programs (see e.g., McGarrell et al., 2006, p. 221; Rosenfeld et al., 2005, p. 428).

Trends in the monthly number of gang-related gun homicides should be analyzed to determine specifically whether violent gun offending by gangs was significantly reduced. The problem analysis described above was, unfortunately, a one-time exercise and these carefully collected circumstance data were not available for the entire 1990 through 2005 time period. Unfortunately, hard-copy SPD homicide files contained very limited information on the actual motives of the defendants involved in homicide events. SHR data do have circumstance data that indicate “juvenile gang” and “gangland” killings. While SHR data has useful information on the objective characteristics of homicide incidents, the validity of SHR circumstance data, however, has been criticized by a series of research studies (Loftin, 1986; Loftin, Kindley, Norris, & Wiersema, 1987; Maxfield, 1989; Riedel, 1989; Williams & Flewelling, 1987). Certain complications, such as incomplete data on offenders, arise from the submission of the data during the early stages of the homicide investigation; other problems develop from the variation in decision rules used by reporting agencies to classify the circumstances of homicides. Given these important shortcomings, it is generally recognized that descriptive, as well as policy-oriented and theory-oriented, research on the circumstances of homicide is difficult. Due to these important limitations, this analysis did not analyze monthly trends in the number of gang-related gun homicides.

Within-Stockton impact assessment: simple pre/post-comparisons

In these analyses, September 1997 was selected as the official start date of the Operation Peacekeeper intervention and December 2002

as the official end date. No other rival programs were implemented in Stockton even roughly close to this time period (Wakeling, 2003, pp. 1–8). Fig. 2 presents the monthly counts of Stockton gun homicide incidents between January 1990 and December 2005. While Stockton was engaging the Peacekeeper strategy, the mean monthly count of gun homicide incidents decreased by nearly 35 percent, from a pre-intervention monthly mean of 2.9 incidents to an intervention period monthly mean of 1.9 incidents. After the Peacekeeper strategy was no longer in place, the monthly mean number of gun homicides increased slightly to 2.1 incidents, but relative to the pre-intervention series, remained low. This simple analysis suggests that the Peacekeeper intervention was associated with a noteworthy reduction in gun homicide in Stockton.

Multivariate analyses

As Fig. 2 suggests, monthly counts of gun homicide incidents in Stockton were distributed in the form of rare event counts. There are well-documented problems associated with treating event count variables, which are discrete, as continuous realizations of a normal data generating process (King, 1989). Methods such as standard mean difference tests and ordinary least squares regression that assume population normality of the dependent variable should not be used to analyze count data (Gardner, Mulvey, & Shaw, 1995). Rather, Poisson regression is generally used to estimate models of the event counts (Long, 1997). The Poisson regression model has the defining characteristic that the conditional mean of the outcome is equal to the conditional variance. In practice, the conditional variance often exceeds the conditional mean (Long, 1997, p. 230). When a sample count distribution exhibits this “overdispersion,” it is unlikely that a Poisson process generated it. Assuming a Poisson process, when the true process generates overdispersed data, results in the same coefficient estimates but underestimates coefficient variances. This results in spuriously large test statistics on the hypothesis that the true coefficient is equal to zero in the population. As the analysis below

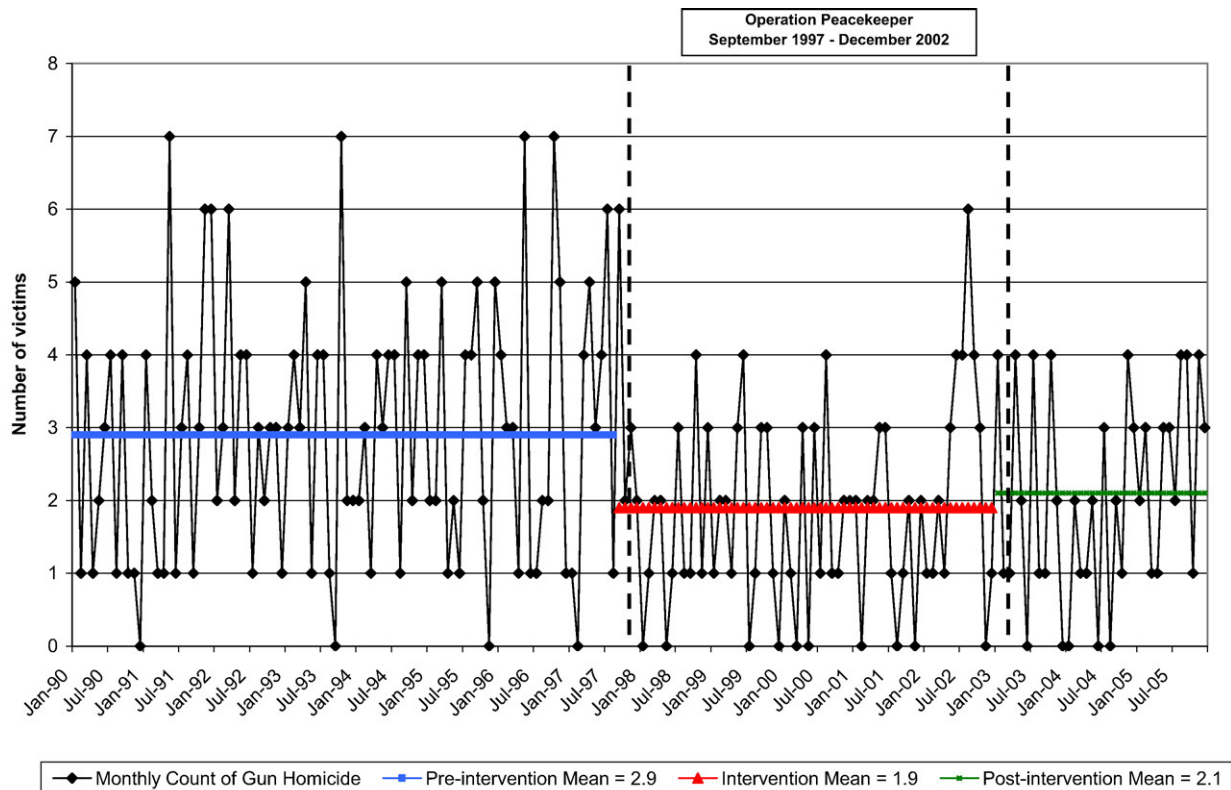


Fig. 2. Monthly Counts of Stockton Homicide Incidents, January 1990 - December 2005.

demonstrates, the distribution of monthly gun homicides in Stockton was overdispersed. When count data are overdispersed, it is appropriate to use the negative binomial generalization of the Poisson regression model. The negative binomial regression model is an extension of the Poisson regression model that allows the conditional variance of the dependent variable to exceed the conditional mean through the estimation of a dispersion parameter (Long, 1997, p. 231).

In addition to determining the nature of the outcome variable distribution, there are three sources of noise in any time series which could obscure intervention effects: *trend*—the series could drift upwards or downwards, *seasonality*—the series could spike at different times (e.g., gun violence increases in summer months), and *random error*—even if the series was de-trended and de-seasonalized, observations would fluctuate randomly around some mean level (McDowall, McCleary, Meidinger, & Hay, 1980). If a time series model does not account for these sources of error, the intervention analysis will be confounded. To account for trends in the time series, a simple trend variable for linear trends and a trend-squared variable for curvilinear trends were included in the model.¹² In order to account for seasonal effects in the model, binary dummy variables for each month were included.

To identify whether there was a serial autocorrelation component, the error structure of the pre-intervention time series was analyzed. Auto regressive integrated moving average (ARIMA) models were used to detect whether the monthly counts of gun violence events were serially autocorrelated (i.e., the number of hits made in January 1990 was significantly correlated with the number of hits in February 1990, and so on) (McDowall et al., 1980, p. 24).¹³ The pre-intervention time series data did not show significant serial autocorrelation; therefore an AR(1) autoregressive component was not estimated in the final model.¹⁴ A covariate was added to control for any changes in the monthly counts of gun homicides that could be associated with existing secular changes in violent crime rate trends in Stockton. To estimate the effects of the intervention on the monthly counts of gun homicide, a multiple category dummy variable was constructed to indicate whether the Peacekeeper intervention was present or not.¹⁵

The parameters for the independent variables were expressed as incidence rate ratios (i.e., exponentiated coefficients). Incidence rate ratios are interpreted as the rate at which things occur; for example, an incidence rate ratio of 0.90 would suggest that, controlling for other independent variables, the selected independent variable was associated with a 10 percent decrease in the rate at which the dependent variable occurs. To ensure that the coefficient variances were robust to violations of the homoskedastic errors assumption of linear regression models, Huber/White/sandwich robust variance estimators were used. Following social science convention, the two-tailed .05 level of significance was selected as the benchmark to reject the null hypothesis of “no difference.” Stata 8.2 statistical software was used to analyze the data. The basic model was as follows:

$$\begin{aligned} \text{monthly count of gun homicide} = & \text{intercept} + \text{intervention} \\ & + \text{post-intervention} + \text{violent crime rate} + \text{trend} + \text{trend}^2 \\ & + \text{monthly dummy variables} + \text{error} \end{aligned}$$

A Poisson regression model was initially used to analyze these data. After the model was run, however, the Poisson goodness of fit test resulted in a chi-square test statistic that rejected the null hypothesis that the observed distribution of the dependent variable was not different from a Poisson distribution (X^2 with 175 df=271.07, $P=0.0168$). Table 1 presents the results of the negative binomial regression model. Controlling for the other covariates, the trend, curvilinear trend, violent crime rate, and month dummy variables were not statistically significant. Controlling for the other predictor variables, however, the Peacekeeper intervention was associated with a statistically significant decrease in the monthly number of gun homicides; according to the incidence rate ratio, Peacekeeper was associated with a 42 percent decrease in the monthly number of gun homicide incidents ($P=.045$). Relative to monthly gun homicide counts in the pre-intervention time series, the incidence rate ratio suggests a nonstatistically significant decrease during the post-intervention time series ($P=.153$). Consistent with the monthly gun homicide counts in Fig. 2, the preventive benefits associated with the Peacekeeper strategy remained but slowly decayed after the

Table 1

Results of negative binomial regression controlling for linear trends, nonlinear trends, seasonal effects, and violent crime trends

Variable	Incident rate ratios	Robust std. error	Z	P> Z	95% confidence interval	
					Lower	Upper
Intervention	0.5805*	.15727	-2.01	0.045	0.34137	0.98725
Post-intervention	0.4950	.24372	-1.43	0.153	0.18859	1.29932
Violent crime rate	1.0003	.00037	0.88	0.381	0.99959	1.00105
Trend	0.9994	.00433	-0.12	0.901	0.99099	1.00802
Trend-square	1.0001	.00003	0.53	0.599	0.99996	1.00007
January	0.9928	.23880	-0.03	0.976	0.61962	1.59080
February	0.8209	.19370	-0.84	0.403	0.51698	1.30366
March	1.0734	.25709	0.30	0.767	0.67132	1.71653
April	0.9867	.24747	-0.05	0.958	0.60360	1.61320
May	1.2659	.30844	0.97	0.333	0.78526	2.04082
June	1.1229	.26898	0.48	0.628	0.70220	1.79577
July	1.2605	.29029	1.01	0.315	0.80262	1.97961
August	0.9503	.26693	-0.18	0.856	0.54800	1.64802
September	1.2084	.30797	0.74	0.457	0.73337	1.99142
October	1.3204	.31851	1.15	0.249	0.82299	2.11859
November	1.0882	.28399	0.32	0.746	0.65253	1.81495
N=192						
Wald X^2 with 16 degrees of freedom=31.42						
Probability of $X^2=0.0119$						
Pseudo $R^2=0.0374$						
Log pseudolikelihood=-344.78753						
Natural log of alpha=-7.02617						
Robust S.E. of alpha=41.73765						

Note: The reference category for the month dummy variable was December.

* $P<.05$.

intervention ceased. Other jurisdictions, such as Boston, Los Angeles, and Minneapolis, experienced difficulty sustaining pulling levers interventions for extended time periods and observed similar decays in violence prevention benefits after the intervention period (Braga & Winship, 2006). Additional research is necessary to understand the difficulties in sustaining these violence prevention efforts and the associated violence upswings observed after the intervention ceases.

Gun homicide trends in Stockton relative to gun homicide trends in other midsize California cities

Although the within-Stockton analyses supported the assertion that a significant reduction in gun homicide was associated with the Peacekeeper intervention, it was necessary to distinguish gun homicide trends in Stockton from broader trends in gun homicide. Many cities in the United States enjoyed noteworthy reductions in homicide and nonfatal serious violence over the course of the 1990s (see e.g., Blumstein & Rosenfeld, 1998; Blumstein & Wallman, 2000). The reductions in other cities could be associated with a number of complex and tightly interwoven endogenous or exogenous factors such as positive changes in the national economy, shifts in the age distribution of offending populations, or the stabilization of urban drug markets. Many cities also implemented crime prevention interventions that have been credited with substantial reductions in violence. The following analyses provide insight on whether Stockton's reduction in gun homicide was part of gun homicide trends experienced in other midsize California cities and whether the program impact associated with the Peacekeeper intervention was distinct in magnitude from other gun homicide reductions occurring at the same time as the Peacekeeper intervention. Since other cities were also taking intervention action to reduce gun homicide, these analyses will suggest whether any program impact in Stockton was larger than, or distinct from, any other deliberate interventions implemented during the same time period.

In order to compare gun homicide trends in Stockton to gun homicide trends in other midsize California cities, monthly counts of SHR gun homicide incidents were analyzed for eight California cities with a population between 200,000 and 500,000 residents during the January 1990 and December 2004 time period.¹⁶ Using the 2000 U.S. Census to determine population size, the comparison group consisted of Anaheim, Bakersfield, Fresno, Long Beach, Oakland, Riverside, Sacramento, and Santa Ana. Table 2 presents basic demographic, violent crime rate, and unemployment rate data for Stockton and the eight comparison cities in 2000. While Stockton was the least populous of the selected cities, its violent crime rate (1219.2) was second only to Oakland (1261.1) among the comparison cities. Relative to the other midsize California cities, Stockton also had the second highest unemployment rate (8.5) and percentage of residents living below the U.S. Census Bureau poverty line (23.9). Only Fresno had a higher unemployment rate (9.7) and percentage of residents living below the poverty line (26.2). Stockton ranked third in the percentage

of non-White residents (56.7), behind Santa Ana (57.3) and Oakland (68.7).

Recognizing that gun homicide trends can vary greatly across midsize California cities, city-specific regression models were specified that would maximize the ability of the models to control the various sources of error in the time series of each city. Kolmogorov-Smirnov tests and Poisson chi-square tests for goodness of fit were used to analyze the observed distributions of the dependent variables for each city in comparison to Poisson, negative binomial, and normal distributions (Kanji, 1993). Kolmogorov-Smirnov tests and Poisson chi-square goodness of fit tests revealed that the monthly counts of gun homicide incidents were distributed as a Poisson process in the Sacramento time series and as a negative binomial process in the Anaheim, Bakersfield, Fresno, and Riverside time series.¹⁷ The monthly numbers of gun homicide incidents for the Long Beach, Oakland, and Santa Ana time series were modeled as normal distributions.¹⁸

Preliminary Poisson, negative binomial, and ordinary least squares (OLS) regression models included city violent crime rate, trend, and month dummy variables to account for seasonal variations and simple linear and curvilinear trends within each time series. An analysis of the residuals from these preliminary models revealed that the Long Beach and Oakland time series had AR(1) serial lag-one correlation components.¹⁹ In these situations, maximum likelihood estimation regression models can be used to estimate coefficients when time series data have first order autocorrelated errors (Ostrom, 1990). Maximum likelihood linear regression models that included AR(1) autoregressive components were used to analyze the Long Beach and Oakland time series. Multiple category dummy variables indicating the time periods when the Stockton Peacekeeper intervention was present or not were included in the models to estimate the trajectory of the monthly counts of gun homicide in each of the time series after Stockton implemented its gun violence reduction initiative.

Table 3 presents the results of the final Poisson, negative binomial, maximum likelihood, and OLS linear regression models controlling for violent crime rates, trends, and seasonal variations. None of the comparison cities experienced a statistically significant reduction in the monthly count of gun homicides that coincided with the implementation of the Peacekeeper intervention in Stockton. Anaheim and Bakersfield experienced nonstatistically significant increases in monthly gun homicides during the intervention and post-intervention time periods. Riverside experienced a nonstatistically significant decrease in monthly counts of gun homicide during the intervention period followed by a nonstatistically significant increase in monthly counts of gun homicide during the post-intervention period. Fresno, Long Beach, Sacramento, and Santa Ana experienced nonstatistically significant decreases in monthly counts of gun homicide during the intervention and post-intervention time periods. Oakland experienced a nonstatistically significant decrease in monthly counts of gun homicide during the intervention period, but a statistically significant decrease in monthly counts of gun homicide during the post-intervention time period ($P=.042$). Unfortunately, there were no

Table 2

Demographic, crime, and employment data for Stockton and eight midsize California cities used in comparison analyses, 2000

	Population	Violent crime rate per 100,000	Percent non-White	Percent persons below poverty	Unemployment rate
Anaheim	328,014	430.8	45.2	14.1	4.6
Bakersfield	247,057	289.8	38.1	18.0	5.7
Fresno	427,652	898.6	49.8	26.2	9.7
Long Beach	461,522	696.8	54.8	22.8	6.0
Oakland	399,484	1,261.1	68.7	19.4	5.6
Riverside	337,977	786.2	40.7	15.8	5.4
Sacramento	407,018	765.8	51.7	20.0	5.2
Santa Ana	337,977	541.2	57.3	19.8	5.7
Stockton	243,771	1,219.2	56.7	23.9	8.5

Note: Violent crime data are available from the U.S. Bureau of Justice Statistics (<http://bjsdata.ojp.usdoj.gov/dataonline/>). Population, racial composition, and poverty data are available from the U.S. Census Bureau (<http://quickfacts.census.gov/qfd/states/06/0603526.html>). Unemployment data are available from the U.S. Bureau of Labor Statistics (<http://data.bls.gov/PDQ/outside.jsp?survey=la>).

Table 3

Results of Poisson, negative binomial, maximum likelihood, and OLS regressions controlling for trends, violent crime rates, and seasonal effects

	Anaheim	Bakersfield	Fresno	Riverside	Sacramento
Model	NB	NB	NB	NB	Poisson
Intervention	.1115	.3627	-.3747	-.1998	-.2355
Std. error	.3589	.2850	.2288	.2716	.1573
Z	0.31	1.27	-1.64	-0.74	-1.50
P> Z	0.756	0.203	0.101	0.462	0.134
Post-intervention	.3023	.0724	-.4827	.1524	-.4026
Std. error	.7419	.5772	.3939	.4095	.3159
Z	0.41	0.13	-1.23	0.37	-1.27
P> Z	0.684	0.900	0.220	.710	0.202
Log pseudolikelihood	-235.45	-262.02	-377.51	-369.01	-394.98
		Long Beach		Oakland	Santa Ana
Model		ML		ML	OLS
Intervention		-2.016		-2.465	-1.132
Std. error		1.048		1.461	0.647
T		-1.924		-1.687	-1.750
P> t		.056		.094	.082
Post-intervention		-2.748		-5.170*	-1.296
Std. error		1.901		2.518	1.132
T		-1.446		-2.053	-1.145
P> t		.150		.042	.254
Log likelihood		-430.977		-433.268	--
R ²		--		--	.479
AR(1)		.080		.172*	--
Std. error		.078		.081	--
T		1.021		2.123	--
P> t		.309		.035	--
N=180 for all models					

Note: Covariates for all regressions included trend, curvilinear trend, city violent crime rate, and month dummy variables. Alpha is the dispersion parameter calculated for negative binomial regression models. In Table 1, the Stockton coefficients were expressed as incident rate ratios. In this table, the standard coefficients are presented.

* $P < .05$.

rigorous evaluations available to provide insights on Oakland's significant reduction in gun homicides in 2003 and 2004. Local newspapers credited a multi-pronged "violence reduction plan," which included federal prosecution of street-level drug dealers and adding curfews to probation conditions for at-risk individuals, with a 23 percent decrease in Oakland homicides between 2003 and 2004 (Lee, 2004).

Careful within-city studies are necessary to unravel gun homicide trends in these cities. Without the benefit of a detailed analysis, it is difficult to know whether there is some broad link between the gun homicide trajectories in such diverse cities. Although some cities experienced nonstatistically significant decreases in gun homicide and Oakland may have benefited from a focused violence reduction initiative during the post-intervention period, Stockton was the only city to experience a statistically significant decrease during the time period that Operation Peacekeeper was in place. This exploratory analysis suggested that the program impact associated with the Peacekeeper intervention was distinct relative to gun homicide trends in other midsize California cities.

Discussion

The impact evaluation suggested that the Operation Peacekeeper pulling levers strategy was associated with a significant reduction in gun homicides in Stockton. The results of the impact evaluation supported the growing body of research that asserts problem-oriented policing can be used to good effect in controlling crime and disorder problems (Braga et al., 1999; Clarke, 1997; Weisburd & Eck, 2004, p. 56). The treatment was a meta-method known as "problem-oriented policing" which was comprised of a number of specific operational tactics implemented by an interagency working group to prevent gun violence among gang-

involved offenders. Problem-oriented policing is an analytic approach, not a specific set of technologies (see Kennedy & Moore, 1995). Problem-oriented interventions arise from diagnoses of problems, and depending on the nuances of particular problems, the responses that are developed, even for seemingly similar problems, can be very diverse. In Stockton, the core set of problem-oriented interventions was framed within the "pulling levers" focused deterrence approach. Since the evaluation was conducted ex post facto, it was not possible to collect the necessary pre-test and post-test data to shed light on the specific mechanisms responsible for the observed reduction. The evaluation was designed to measure the efficacy of the broader pulling levers approach in controlling gun homicide and did not attempt to parse out the varying effects of the specific initiatives that were implemented, although this would be very useful to do in future program evaluations.

The growing body of research evidence on the efficacy of the pulling levers intervention suggests a new approach to controlling violent offenders through a more focused application of deterrence principles (Kennedy, 1997, p. 460). In contrast to broad-based "zero tolerance" policing initiatives that attempt to prevent serious offending by indiscriminately cracking down on minor crimes committed by all offenders, the pulling levers deterrence strategy seeks to control violence by focusing on particular groups that were behaving violently, subjecting them to a range of discretionary criminal justice system action, and directly communicating this message to a very narrow and specific audience. In addition to any increases in the certainty, severity, and swiftness of sanctions associated with gun homicide, the Operation Peacekeeper strategy sought to gain deterrence through the *advertising* of the law enforcement strategy (Zimring & Hawkins, 1973), and the personalized nature of its application. It was crucial that gang youth understood the new regime that the city was imposing. In his essay

on the misapplication of deterrence principles in gang suppression programs, **Malcolm Klein (1993)** suggests that law enforcement agencies do not generally have the capacity to “eliminate” all gangs in a gang-troubled jurisdiction, nor do they have the capacity to respond in a powerful way to all gang offending in such jurisdictions. The participating Peacekeeper agencies recognized that, in order for the strategy to be successful, it was crucial to deliver a credible deterrence message to Stockton gangs. Therefore, the Peacekeeper intervention targeted those gangs that were engaged in violent behavior rather than expending resources on those who were not.

Beyond deterring violent behavior, the pulling levers strategy was designed to facilitate desired behaviors among Stockton gang members through the strategic provision of social services and the involvement of the community. As **Spergel (1995)** observes, coordinated strategies that integrate suppression, social intervention, opportunity provision, and community organization are most likely to be effective in dealing with chronic youth gang problems. Gang outreach workers and others added a much needed social intervention and opportunity provision dimension to the Operation Peacekeeper strategy. With these resources, the participating Peacekeeper agencies were able to pair criminal justice sanctions, or the promise of sanctions, with help and with services. The availability of social services and opportunities were intended to increase the strategy's preventive power by offering gang members any assistance they may want: counseling, drug treatment, access to education and job training programs, and the like.

The Operation Peacekeeper working group also consistently sought community involvement in their gun homicide reduction efforts. By engaging the community in their violence prevention efforts and creating a sense of joint ownership of the gang violence problem, the participating criminal justice agencies created the political support necessary for both innovation and more focused and aggressive intervention. With their involvement in the strategy, the community members were more likely to support the approach as a legitimate violence prevention campaign (**Braga & Winship, 2006**, pp. 180–183; **Winship & Berrien, 1999**). Given the potentially harsh law enforcement levers that can be pulled as part of a focused enforcement program, community involvement is critical in replicating and sustaining such intensive violence prevention initiatives. Without the political support of the community, the police cannot pursue an innovative enforcement strategy that targets truly dangerous youth at the heart of urban youth violence problems.

The Operation Peacekeeper working group applied the basic principles of problem-oriented policing to a substantial public safety problem. Addressing this problem required the involvement of multiple agencies and the community, as well as substantial investments in analysis, coordination, and implementation. The experience of the working group suggests that deploying criminal justice capacities to prevent crime can yield substantial benefits. The problem-solving orientation of the project means that the problem definition, the core participants, and the particulars of the intervention evolved over the course of the collaboration. Peacekeeper strategy itself was highly customized to the goals of the collaboration, the particular nature of the gun violence problem in Stockton, and the particular capacities available in Stockton for incorporation into a strategic intervention. The Peacekeeper strategy as such is unlikely to be a highly specifiable, transportable “technology.” Certain process elements of Peacekeeper, such as the central role of the line-level working group and the use of both qualitative and quantitative research to “unpack” chosen problems, should be generally applicable to other problem-solving efforts. Using the working group problem-solving approach, criminal justice practitioners in other jurisdictions can develop a set of intervention strategies that fits both the nuances of their gun violence problem and their operational capacities. Although the resulting package of interventions may not closely resemble the tactics used in Peacekeeper, the problem-oriented lever pulling frameworks will be similar.

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Notes

1. Law enforcement agencies in different cities use varying definitions for gang-related crime and these definitional differences can influence the amount of crime that is reported as “gang related” across cities (Maxson & Klein, 1990). For example, Los Angeles police define crime as gang related when gang members participate, regardless of motive. Chicago police use a more restrictive definition and classify homicides as gang related only if there is a gang motive evident.

2. Berk (2005) raises a number of statistical and methodological concerns with the analysis developed by Rosenfeld et al. (2005).

3. The core group of service providers included the Employment and Economic Development Department, the jointly administered City of Stockton and San Joaquin County Youth Outreach Services program, the Center for Positive Prevention Alternatives, El Concilio, Lao Family Community Services, the Whole Life Center, the Community Partnership for Families of San Joaquin, the Vietnamese Voluntary Organization, and the Asian Pacific Self-Reliance Association (Wakeling, 2003, p. 7).

4. Interview with Assistant U.S. Attorney Richard Bender of the Eastern District of California on July 18, 2007.

5. Interview with Assistant U.S. Attorney Richard Bender of the Eastern District of California on July 18, 2007.

6. Stewart Wakeling's San Joaquin County administrative records were received by the author on July 17, 2007.

7. For these purposes, drawing on gang research conducted in Boston, homicides and aggravated gun assault incidents were considered connected to gang activity if (a) the offender or the victim (but not necessarily both) was a gang member, and (b) the motivation behind the violent event was known or believed to be connected to gang activity (Kennedy, Braga, & Piehl, 1997). Thus, the killing or assault of a gang member by another gang member in a dispute over contested turf would be considered gang related; the killing or assault of a non-gang innocent bystander during the same dispute would be considered gang related; the killing or assault of a gang member by a non-gang member during a robbery attempt or a domestic dispute would not be considered gang related.

8. Defining the term *gang* is a very complex issue (Ball & Curry, 1995). The SPD used a definition of gang developed by the California State Legislature. Section 186.22 of the California Penal Code (1988) defines a ‘criminal street gang’ as: ‘any ongoing organization, association, or group of three or more persons, whether formal or informal, having as one of its primary activities the commission of... criminal acts... having a common name or common identifying sign or symbol, and whose members individually or collectively engage in, or have engaged in, a pattern of criminal gang activity.’ This formal definition of a criminal street gang was used in the problem analysis research.

9. The selection of September 1997 as the official start date of Operation Peacekeeper was supported by the following sources: (a) an official California Attorney General's Office and the California Health and Human Services Agency report (Wakeling, 2003, p. 3), (b) interviews with three key participants in the Peacekeeper initiative: SPD Chief Wayne Hose, Assistant U.S. Attorney Richard Bender, and Stewart Wakeling, former Juvenile Justice Coordinator for San Joaquin County, and (c) local media coverage of the initiative (e.g., Tempest, 2001, p. A1).

10. The following insights on the SPD management of the Peacekeeper initiative were obtained during an interview with Chief Wayne Hose on July 18, 2007. Hose was the first commander of GSET when the unit started engaging Peacekeeper activities in September 1997. According to Hose, he left GSET when promoted from Lieutenant to Captain in January 2000. The subsequent commander of GSET, then Lieutenant Blair Ulring (now Deputy Chief Ulring), continued the same Peacekeeper approach until he was promoted to Captain in November 2002. According to Wakeling, after Ulring left the unit, the new GSET commander did not engage the Peacekeeper strategy and the interagency working group had completely stopped meeting by January 2003. San Joaquin County administrative records date the last official Peacekeeper forum as October 24, 2002. The forum communication strategy was no longer in place after that date.

11. The SPD Crime Analysis Unit reports homicide data to the FBI UCR and SHR programs. A comparative analysis of the SPD homicide data and SHR and data

confirmed that there were not significant differences between the two data sources in monthly counts of gun homicide incidents. Since the two data sources were essentially the same, Stockton SHR data were used to facilitate comparisons with SHR homicide trends in the control California cities.

12. The trend variable was simply the month number from the start to the end of the time series (i.e., for the January 1990 through December 2005 series, the trend variable ranged from 1 to 192). The trend-squared variable was calculated by taking the square of the trend variable.

13. These analyses were pursued to ensure that the possible sources of error were accounted for in the Poisson regression model; ARIMA models were not used to measure intervention effects. Identifying appropriate ARIMA models for evaluation purposes can be a very subjective exercise. As Gary Kleck (1997) suggested, "Experts in ARIMA modeling also commonly point out difficulties that even experienced practitioners have in specifying time series models. Specification is very much an art rather than a science, so that different researchers, using the same body of data, can make substantially different, even arbitrary decisions, and, as a result, obtain sharply different results" (p. 354).

14. Using a variety of ARIMA specifications, statistically significant nonseasonal autocorrelation was not detected in the time series data. To smooth the count data for regression analysis, monthly counts of gun homicide were transformed using natural logarithms in all models (Tufté, 1974, p. 108). For example, using an ARIMA (1,1,1)(1,1,1) model, significant serial autocorrelation was not detected: nonseasonal $AR(1) = -.026$, $t = -.202$, $P = .840$. An OLS model was also run on the pre-intervention time series (monthly gun homicide counts = constant + trend + trend2 + month dummies + error) and the residuals were analyzed using the Durbin Watson test (result = 2.3). According to Pindyck and Rubinfeld (1991), Durbin-Watson test ranges from zero to four. First-order serial correlation does not exist when the Durbin-Watson statistic is close to two.

15. The pre-intervention period of the time series served as the reference category. Binary covariates were constructed for the intervention time period (0 = not intervention time period, 1 = intervention time period) and the post-intervention time period (0 = not post-intervention time period, 1 = post-intervention time period).

16. These data were also obtained at the National Archive of Criminal Justice Data at the Inter-university Consortium for Political and Social Research. Unfortunately, 2005 SHR data had not been released by the U.S. Department of Justice at the time of this analysis. The city of Fremont (population of 203,413 in 2000) was excluded from these analyses due to very low gun homicide counts.

17. Kolmogorov-Smirnov tests were initially used to determine that these distributions were significantly different from a normal distribution. The specification of the appropriate distributions for the remaining count data time series were based on the Poisson goodness of fit chi-square tests available after exploratory Poisson regression models were run (controlling for trends, violent crime rates, and seasonal dummy variables). The tests confirmed negative binomial distributions by rejecting the null hypothesis that there is no difference between the observed distribution and a Poisson distribution for Anaheim ($\chi^2 = 213.26$ with $df = 163$, $P = 0.0050$), Bakersfield ($\chi^2 = 220.31$ with $df = 163$, $P = 0.0019$), Fresno ($\chi^2 = 204.24$ with $df = 163$, $P = 0.0157$), and Riverside ($\chi^2 = 221.60$ with $df = 163$, $P = 0.0015$). Sacramento, however, failed to reject the null hypothesis ($\chi^2 = 192.05$ with $df = 163$, $P = 0.0595$), and was determined to be a Poisson process.

18. For Oakland, the Kolmogorov-Smirnov test yielded a $Z = 1.349$ and $P = .053$. As such, the null hypothesis that the Oakland gun homicide distribution was significantly different from a normal distribution was not rejected. Determining the most appropriate distribution for the Long Beach and Santa Ana gun homicide distributions was more complex. Kolmogorov-Smirnov tests suggested that these time series were neither distributed normal nor Poisson. Since this was an exploratory analysis and OLS regression is robust to modest violations of normality assumptions (Tufté, 1974), the Santa Ana and Long Beach time series were modeled as normal distributions.

19. The Durbin-Watson test result was 1.5 for the Oakland time series and 1.6 for the Long Beach time series. The Durbin-Watson result for the Santa Ana time series was 1.9 suggesting no serial autocorrelation.

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